

UNITED STATES GOVERNMENT

2-Way Memo

Subject :

SMD-III Medical Support Plan

To :



Bill Thornton, M.D.

CB

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Bill,

You've been exposed to the details of the 3 clinical OTRs for SMD-III. The attached draft SMD-III Medical Support Plan document takes the substance of these OTRs and develops an overall coordinated medical support posture for SMD-III. Several of the TBDs in the current draft are set for replacement by 'hard-core' narrative and we would actually like to get the document formally set in January. Your opinions on the current draft would be appreciated, preferably before the formal review (planned 1PM 7 January '77) by the Space/Clinical Medicine Branch.

As background, let me state that Bummel, Bush, Cress, Mangold, and Pool (obviously) are all apprised of the draft and will be apprised of the formal review date.

From :

Jerry R. Hordinsky, M.D.
DB 52

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S M D I I I

M E D I C A L S U P P O R T P L A N



LIFE SCIENCES DIRECTORATE
National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER
Houston, Texas
September 15, 1976

SMD III MEDICAL SUPPORT PLAN

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1.0 INTRODUCTION

1.1 PURPOSE

This document will guide SMD III participants in the level of medical support available for SMD III.

1.2 SCOPE

This document covers pre, in-, and post-test medical support for the SMD III test scheduled for early 1977.

1.3 AUTHORITY

The authority for this plan has been given by the Acting Director of the Life Sciences Directorate, Johnson Space Center.

1.4 APPLICABILITY

This document is applicable to both test participants as well as all supporting personnel involved with SMD III.

1.5 DEFINITIONS

TBD

2.0 SMD III PROJECT DESCRIPTION

2.1 GENERAL

SMD III is the third Life Sciences Directorate Orbiter/Payload Simulation Test and will involve biomedical experiments from both JSC and Ames Research Center.

2.2 SMD III MISSION MEDICAL OBJECTIVES

The objectives for SMD III include:

- a. Provision for the health care of test participants, to include pre-test physicals and a modified flight crew health stabilization.
- b. Provision and development of medical monitoring techniques during the test in such a way as to simulate actual anticipated Shuttle performance patterns.
- c. Utilization of a medical kit similar to the anticipated Shuttle medical kit in an effort to verify the adequacy thereof.
- d. Enact at least three medical simulations during the test in order to rehearse the actual capabilities of the medical support system.
- e. Outfit the JSC Flight Medicine Clinic and the on-call physicians with the supporting communication equipment in order to allow monitoring of the test from the JSC Clinic and to provide efficient on-call capability in the pattern anticipated for development for the actual Shuttle era.

3.0 MEDICAL SUPPORT DESCRIPTION

3.1 GENERAL

Medical support will be primarily directed to the test participants with the intent of rehearsing those modalities of support which will be in effect during the Shuttle era.

3.1.1 Population of Personnel Requiring Medical Support

The test crewmembers will be the primary beneficiaries of the medical support plan. Additionally, other test support members can avail themselves of routine medical inquiries, but no formal medical testing program or medical monitoring program for the test support members will exist during SMD III. For an actual Flight Mission Control Room, personnel would need to undergo annual Class III flight-type physicals; additionally, persons in direct final support of the crew would need primary contact examinations to satisfy requirements.

3.1.2 Operational Medical Support Requirements

3.1.2.1 Routine Medical Care

Routine medical care pre-test will be provided by the JSC Flight Medicine Clinic. This pre-test period is designated as the six-month prior to test initiation. During-test medical care will be provided utilizing the onboard medical kit and the monitoring and paging capability set up through the Flight Medicine Clinic as well as the Medical Officer's Console in the test operations area.

3.1.2.2 Flight Crew Health Stabilization

Laboratory support through the Flight Medicine Clinic will be utilized to carry out the checks at 21 days and 7 days pre-test. Nominal Shuttle Mission Flight Crew Health Stabilization will not be enforced for this test.

3.1.2.3 Pre- and Post-Test Physical Examinations

A single pre-test physical examination to Class III flight standards for the Payload Specialists and Class II for the Mission Specialists will be performed in the period between five weeks prior to and four weeks prior to the actual test. Heal status checks will be made daily in the last week pre-test. Post-test physical examination will consist of only a brief check of the crew, except that in the event of inflight medical problems a full post-test examination will be required in the period within four hours of test termination.

Actual Shuttle missions would have Payload Specialists subject to Phase I Evaluations 12 months before mission start, Phase II Evaluations six months before mission start, and Phase III Evaluations at three months, one month, and daily (for one week) preflight.

Phase I Evaluations include:

- Medical Survey
- General history and physical examination
- Laboratory testing of blood, urine, stool
- Radiological evaluation
- Dental evaluation
- Psychiatric and psychological evaluation

Phase II Evaluations include:

- Motion sensitivity questionnaire
- Semi-circular canal function evaluation
- Audiometric evaluation
- Neurological evaluation
- Cardiopulmonary evaluation (exercise stress, LBNP, pulmonary function)

Phase III Evaluations are short health status reviews utilizing a quick history and physical examination as dictated by any observed symptoms and signs.

In actual Shuttle missions the Mission Specialist will be subject to the annual flight physical certification requirements. Additionally, on assignment to a flight he would be subject to Phase III-type evaluations at three months, one month, and daily (for the last week) preflight.

For SMD III there will be an additional Payload Specialist exercise in which Phase I and Phase II evaluations will be rehearsed by the Flight Medicine Clinic, but these will be out of the timing proposed in actual Payload Specialist selection and medical clearance. Both phases will probably be fused into one examination period.

3.1.2.4 Emergency Medical Care

Emergency medical care at all times will consist first of the front line on-call physician response and will be backed up by the capability for appropriate referrals to the Clear Lake Hospital or other definitive medical care facility.

3.2 MEDICAL SUPPORT PLANNING GUIDELINES

3.2.1 Interface with Preliminary Evaluation Team (PET)

The PET should be alerted to the need for extraction of clinically relevant data from medical experiments. When experiments of seemingly equal value are being judged, the greater clinical relevance of one above the other is recommended as a decision point for selecting the proposed experiments. The same consideration should be applied in the revision of any onboard medical experiments.

3.2.2 Interface with SMD III Mission Management Board (MMB)

The MMB should be fully apprised of the overall test medical monitoring in effect for SMD III as well as the test requirements for optimum development of pre-test medical examinations and flight crew health stabilization, future medical kits, medical monitoring capability, and direct flight medicine clinic monitoring of ongoing tests.

4.0 LIFE SCIENCES DIRECTORATE (LSD) MANAGEMENT PLAN

4.1 GENERAL

The LSD Management Plan acknowledges the primary support role of the operational medical groups as well as the associated personnel, equipment, and space requirements.

4.2 MISSION MANAGEMENT BOARD ORGANIZATION FUNCTIONS AND ACCOUNTABILITY

The Director of the MMB will be Lawrence F. Dietlein, M.D., Acting Director of Life Sciences. The prime representative for the Operational Medical Group will be Sam L. Pool, M.D., Chief of Space Clinical Medicine Branch. The Chief of the Space Clinical Medicine Branch will assure that an appropriate call schedule is structured to affect the medical support programmed by the support plan and by the operational test requirements.

4.3 PRELIMINARY EVALUATION TEAM ORGANIZATION FUNCTIONS AND ACCOUNTABILITY

TBD

4.4 MEDICAL OPERATIONAL TEAM FUNCTIONS AND ACCOUNTABILITY

The medical team will be organized under the Chief, Space Clinical Branch and will as a minimum consist of an on-call physician to support the pre-, in-, and post-test proceedings. One of the on-call physicians will be designated as SMD III Chief Test Support Physician.

4.4.1 Medical Operations Team Management

The on-call physician, through the designated Chief Test Support Physician, will report to the Chief of the Space Clinical Medicine Branch who will interface with the MMT and the PET.

4.4.2 Medical Operations Team Information Management

The specific flow of information by the Medical Ops Team will be dictated by the five operational test requirements separately detailed for SMD III.

4.4.3 Medical Operations Team Support Coordination

The specific equipment and communication support required will be detailed through the five operational test requirements and would be supplied by the overall test operations team.

5.0 MEDICAL SUPPORT ORGANIZATION

5.1 GENERAL

Physicians will be rotating on-call during the test period.

In the pre-, in-, and post-test periods, one physician will be designated as SMD III Chief Test Support Physician.

5.2 MEDICAL OPERATIONS TEAM ORGANIZATION

Chief, Space Clinical Medicine Branch

Chief Test Support Physician

On-call Test Physician

Six Data Management/Communication

Control Personnel - (three on clinic shifts
(three on test-site shifts

5.3 MEDICAL OPERATIONS TEAM FUNCTIONS AND ACCOUNTABILITY

The Chief, Space Clinical Medicine Branch will interface with the PET and MMT. In regard to all operations during the test the individual physicians on-call will interface directly with the Test Director in the support of SMD III. Individual on-call physicians will transfer data at specific handover sessions between change of shifts (7:00am - 3:00pm, 3:00pm - 11:00pm, 11:00pm - 7:00am). The physician on evening call will be involved with monitoring the medical status report as well as any medical conference call at that time. At other periods the physician-on-call will be reached by the paging system and/or telephone and will respond to any actual or simulated medical problems during the test procedure.

5.4 ADDITIONAL SUPPORT PERSONNEL

Other operational test team members will have to assist

with accumulating the medical data that is collected during the course of the test and providing and collecting it in the physician's console area at the test site.

6.0 FACILITIES, EQUIPMENT, AND SUPPLY PLAN

6.1 GENERAL

Facilities, equipment, and supplies will be located at the SMD test site, at the Flight Medicine Clinic (Building 8), and the radio paging equipment assigned to support the SMD III test.

6.2 CLINICAL MEDICINE FACILITIES, EQUIPMENT, AND SUPPLIES

6.2.1 Facilities

6.2.1.1 Location

The medical monitoring console will be in close proximity to the Test Director's console at the SMD III test site. The Shuttle medical kit will be in the test vehicle. The Clinic monitoring facility will be in Room 124, Building 8.

6.2.1.2 Capability

The monitoring facility at the test site will have no treatment capability as such, but will represent largely monitoring capability. The capability at the Clinic will permit general outpatient care but for the purposes of this test will be primarily structured to provide remote monitoring capability as projected for the Shuttle era.

6.2.1.3 Availability

The test-committed monitoring sites (both fixed and mobile) should be available and functional at least one week prior to test initiation and through and until the tests end.

The test medical examination sites must be available for the 12-month, six-month, three-month, one-month, and final week pre-test checks as explained in the OTR No. ____.

6.2.2 Equipment and Supplies

6.2.2.1 Location

Equipment will be located in the facilities specifically referenced in Item 6.2.1.1.

6.2.2.2 Availability

Equipment and supplies (with the exception of the items that follow) will be available at least one month prior to test initiation and until the termination of the actual test. Diagnosing and testing equipment must be available six months pre-test as explained in OTR No. ____.

6.2.2.3 Listing

Equipment and supplies at the test site include the communication (both audio and visual) capability as well as a semi-enclosed area to permit collection of medical data, storage thereof, and the secure discussion of medical problems with the crew. The other medical equipment available at the test site will consist of the actual medical kit within the test vehicle and the specific contents thereof listed in OTR No. ____.

The equipment and supplies available at the Clinic include general outpatient clinic equipment and in addition include a monitoring console with video and audio reception from the test site. ECG reception will be simulated. Additionally, the clinic console should permit communication with the Test Director and test crewmembers. Special diagnostic equipment for pre-test examinations include - T B D

The communications equipment will consist of a radio-telephone and a backup paging device that can be used to reach the physician who is on-call. For the test no specific additional medical equipment such as medical diagnostic and treatment equipment and aircraft or spacecraft

accident investigation equipment will be included.

6.3 EMERGENCY MEDICAL TREATMENT FACILITIES, EQUIPMENT, AND
 SUPPLIES

6.3.1 Facilities

6.3.1.1 Location

The only emergency medical treatment capability specifically to be designated for this test will be JSC Clinic in the event of in-test or end-of-test medical emergency. Serious medical problems may be referred directly to the Clear Lake Hospital.

6.3.1.2 Capability

Routine medical emergency capability will be assumed at the facility designated in 6.3.1.1.

6.3.1.3 Availability

Availability is on a continuous basis not dependent on test schedules.

6.3.2 Equipment and Supplies

6.3.2.1 Location

Equipment is located at the facility designated in 6.3.1.1. Additionally, some of the basic medical equipment in the test medical kit as well as in the Flight Medicine Clinic can serve as basic emergency equipment but is not considered definitive emergency medical equipment within the context of this section.

6.3.2.2 Availability

The designated hospital and clinic equipment is available on a continuous basis. The Shuttle medical kit should be outfitted and available within one week of initiation of test.

6.3.2.3 Listing

In lieu of any specific list, it is assumed that the emergency capability at the Clear Lake Hospital is adequate to support any anticipated problems in SMD III. Shuttle medical kit contents are listed in OTR No. _____.

7.0 MEDICAL PROCEDURES

7.1 PRE- AND POST-TEST PHYSICAL EXAMINATIONS

The pre-test examination will be a Class III Standards examination of the Payload Specialist and a Class II Standards examination of the Mission Specialist as appropriate during the period five weeks prior to and four weeks prior to the test. Brief checks will be made daily in the final week pre-test. The post-test physical examination will be within four hours of test termination and will consist of a quick look and discussion unless there have been medical problems during the actual test enactment.

As referenced in 3.1.2.3 Phases I and II type Payload Specialist examinations will be introduced in variable fashion prior to SMD III.

7.2 ROUTINE MEDICAL MONITORING

Routine medical monitoring will consist of collection of the daily medical status report, and the clinically relevant data from the medical experiments, and will consist of a continuous on-call system for physicians during the time of the actual test enactment.

7.3 ROUTINE MEDICAL CARE

Pre- and post-test routine medical care will not differentiate itself from regular medical care provided to test subjects at JSC. Routine medical care inflight will consist of advising the crew of diagnostic and treatment modalities available within the limits of the Shuttle medical kit and crew training and will follow in direct response to either real or simulated medical problems voiced in flight.

7.4 FLIGHT CREW HEALTH STABILIZATION

Flight crew health stabilization for a nominal mission would

consist of strict microbial and environmental controls for one week prior to mission. This would entail separate quarters for crew and passengers, closed ventilation systems, security control, and restriction of experiment training in the week preflight as a result of contact control by distance and masks.

Consequently, for this test only a microbial check of crew and passengers (oral, nasal, skin, stool, urine, blood) will be made at 21 days and 7 days pre-test, with treatment or observation only instituted based on the results of these checks.

7.5 MEDICAL EMERGENCY RESPONSE

Actual medical emergencies will result in termination of the test and disposition of personnel to appropriate definitive facilities. Simulated medical problems during test will not result in abort conditions during this simulation.

8.0 TRAINING PLAN

8.1 GENERAL

The test crewmembers, the test operations team, as well as specific physicians-on-call, must be fully apprised of the examination, treatment, and monitoring standards and capabilities. At least two hours briefing time with the crew, four hours briefing and discussion with the test operations team, and four hours with the on-call physician will be required to accomplish these goals.

8.2 CREW MEDICAL TRAINING

The crew should have a minimum of two hours of training in the utilization of the medical kit as well as in familiarization of the crew with the physicians monitoring the specific test. Training should include discussions as to the options available both to the crew and to the physicians in the event of given medical problems

9.0 DOCUMENTATION PLAN

9.1 GENERAL

Documents will primarily define the categories and detailed content of medical information that is anticipated for collection during test.

9.2 DOCUMENTATION TREE

- Daily Medical Status Report

- Illness/Injury Report

- Experimenter's Report of Clinically Significant Data

- Physician's Report to Test Director

- Daily Medical Status Report to MMB

- Phase I, Phase II Medical Evaluation Status Report

- Phase III Medical Status Report

- Summary Medical Preflight Status Report

- Summary Inflight Medical Status Report

9.2.1 Organizational Responsibilities

Primary responsibility to insure correct documentation rests with the physician designated as Chief Test Support Physician. He will be assisted by the other members of the Test Medical Operations Team and by six designated data management/communications control personnel.

9.3 DOCUMENTATION MANAGEMENT

The daily medical status report and the illness/injury reports are for internal medical use. The pre-test and in-test status reports will be available to the Test Director and the MMB and for any other operational team utilization as may be required.

Data collation and assistance with communication management will be the chief assignment of the data management/communication control personnel.

9.4 MEDICAL REPORTING AND DEBRIEFING

A daily briefing by the Test Director of the physician-on-call and vice-versa will take place in proximity to the time of the daily medical status report. The chief test support physician will make a daily report to the MMB and a final summary report at the end of the test period.

9.5 MEDICAL RECORDS AND DATA

All data generated by the pre- and in-test will be utilized to answer or resolve any real or simulated inflight medical problems and will be filed and analyzed in order to generate a summary statement about the test as to the effectiveness of the planned Shuttle medical capability.

APPENDIX A

SHUTTLE MISSION DEMONSTRATION - III (SMD III)

FLIGHT CONTINGENCY MEDICAL PLAN

APPENDIX A

SMD III FLIGHT CONTINGENCY MEDICAL PLAN

Any flight contingencies either real or simulated in SMD III will be responded to by the physician-on-call via the established communication system. The established communication system consists of the monitoring console in Building 8 as well as the radio-telephone and paging system available to the JSC MOD.

Any actual serious medical contingency developing during the test will result in termination of the test and referral of the injured or ill parties to definitive medical care. Any simulated or mild, real medical problems will be responded to in the manner of an actual flight with advisory statements being provided by the physician on-call to the querying crewmembers as well as with general planning information guidelines to the Test Director and his team. These planning guidelines will reflect the amount of anticipated workup time and the incapacity to the crewmember anticipated from the given medical problem (either real or simulated).

APPENDIX B

SHUTTLE MISSION DEMONSTRATION - III (SMD III)

MEDICAL MISSION RULES

APPENDIX B

SMD III MEDICAL MISSION RULES

The following items will result in actual mission or test termination:

Severe injuries

Unresolvable medical diagnostic problems

The physician-on-call will have primary decision authority in medical questions posed by real or simulated medical events. His inputs are made directly to the Test Director if inadequate time exists to discuss the situation in the Medical Operations Team or in the MMB.

APPENDIX C

SHUTTLE MISSION DEMONSTRATION - III (SMD III)

MEDICAL REPORT FORMS

Appendix D

SHUTTLE MISSION DEMONSTRATION-III (SMD-III)

MEDICAL EQUIPMENT AND SUPPLY LISTING

APPENDIX D

MEDICAL EQUIPMENT AND SUPPLY LISTING

Test site: Shuttle medical kit (see OTR # for list).

Test medical console site: audio, visual (ECG simulated).

Flight Medicine Clinic test monitoring site: audio, visual, general outpatient medical capability, (ECG simulated).

Radiotelephone, pager, (medical equipment, accident investigation equipment simulated).

Clear Lake Hospital: standard medical emergency capability.

TBD: Phase I-II pre-test payload specialist diagnostic testing materials.